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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,565	02/23/2004	Cyrus Ashtiani	510.1057	9824

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EXAMINER
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FANTU, YALKEW

ART UNIT	PAPER NUMBER
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2838

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05/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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**Office Action Summary**

Application No.

10/785,565

Applicant(s)

ASHTIANI ET AL.

Examiner

Yalkew Fantu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii (US 5,663, 628).

With respect to claim 1, a method of determining the deterioration of a battery (Fig. 1), charge and discharge cycles of the battery are measured by number and depth of the charge discharge; (Fig. 6; Col. 11, lines 54-58); a characteristic deterioration value is determined for each of the charge and discharge cycles on the basis of a deterioration curve (Fig. 4), and individual characteristic deterioration values are summed up (a sum of "some" includes summing one value: broad interpretation; besides, fig. 4, depicts characteristics of discharge currents and duration of various batteries summed up in a single chart) to obtain the deterioration of the battery (Col. 10, lines 1-23).

Regarding claims 3 and 9, the dependency of the characteristic (Col. 11, line 54) deterioration values on the depth discharge (Col. 11, line 55) is defined for the respective battery type (Col. 10, lines 5-10) by the deterioration curve as a continuous function (Fig. 6 and 7).

Claims 1, 2, 5, 6, 11 and 12 are rejected under U.S.C. 102(b) as being anticipated by Yoshikawa et al. (US 6,317,697).

With respect to claim 1, a method of determining of the deterioration of a battery (Col. 8, lines 20-23; col. 11, 10-13), where the charge and discharge cycles of the battery are measured by number and depth of discharge (Col. 8, lines 20-25), and characteristic deterioration value is determined for each charge and discharge cycles (Col. 15, 35-37), and individual characteristic deterioration values are, at least summed up (some of the characteristics summed up as in fig. 4, which depicts characteristics, such as discharge currents and duration of various batteries; a sum of "some" includes summing one value) to obtain the deterioration of the battery (Col. 9, lines 37-43).

With respect to claim 2, each partial cycle of charging and discharging measured separately, the characteristic deterioration value being determined for each of the partial cycles (Fig. 6), and values for all partial cycles being, at least some, summed up (Col. 18, lines 56-64).

Regarding claims 5 and 11, the deterioration curve (Fig. 29A) is adapted to the conditions prevailing in the region of the battery using weighting factor (Fig. 15).

With respect to claims 6 and 12, the weighting factors are dependent on the temperature (Col. 15, lines 40-41).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii (US 5,663,628) in view of Seri et al. (US 5,994,877).

With respect to claims 4 and 10, Fujii discloses a method of determining the deterioration of a battery, where a charge and discharge cycles of the battery are measured by number and depth of the discharge as set forth in the 35 USC 102 rejection above, however does not disclose the depth of discharge is defined for battery type by the deterioration curve of approximate intervals. Seri et al. reference, however, teaches that the depth of discharge is defined for different battery type by the deterioration curve, which is adapted to the respective battery type (Col 6, lines 46-52).

Fujii and Seri et al. are analogous art because they are from the same field of endeavor namely battery life determination methods.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to have added weighting factor dependency to the discharge current of Fujii in view of the teaching of Seri et al.

The suggestion and motivation for doing so would have been obvious in view of the teachings of Seri et al. that by adding the dependency relationship of current to that of a weighting factor help to determine the deterioration of a battery.

Claims 7, 8 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii (US 5,663,628) as applied to claims 1, 3, and 9 and Yoshikawa (US 6,317,697) as applied to claims 2, 5, 6, 11 and 12 above, in view of Kinoshita (US 5,703,469).

Regarding claims 7, 8 and 13 - 20 Fujii discloses a method of determining the deterioration of a battery, where a charge and discharge cycles of the battery are measured by number and depth of the discharge, and Yoshikawa discloses the deterioration curve is adapted to the conditions prevailing in the region of the battery using weighting factor as set forth in the 35 USC 102 rejection above, however, both Fujii and Yoshikawa do not teach:

Regarding claims 7, 8, 13 and 14, that the weighting factors are dependent on discharge current. Seri et al. reference, however, teaches dependency on the discharge current (Col. 6, lines 46-52).

With respect to claims 15 and 18, that the discharge cycles with a capacity efficiency are considered within a predetermined limit. Seri et al. reference teaches that the discharge capacity throughput considered within a predetermined limit. (Col. 3, lines 11-15; col. 4, lines 15-20)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to have added weighting factor dependency on the discharge current, and that the discharge cycles with capacity efficiency are considered within a predetermined limit so that the method would consider the characteristic factors that have impact in determining battery deterioration.

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Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii (US 5,663,628) as applied to claims 1, 3, and 9 and Yoshikawa (US 6,317,697) as applied to claims 1, 2, 5, 6, 11 and 12 above, in view of Kinoshita (US 5,703,469).

Regarding claims 16, 17, 19 and 20, Fujii discloses a method of determining the deterioration of a battery, where a charge and discharge cycles of the battery are measured by number and depth of the discharge, and Yoshikawa discloses the deterioration curve is adapted to the conditions prevailing in the region of the battery using weighting factor as set forth in the 35 USC 102 rejection above, however, both Fujii and Yoshikawa do not teach a battery that is used in a motor vehicle for supplying electric power to electronic auxiliary components, and to propulsion components.

The Kinoshita reference, however, teaches a battery which is mounted as an energy source on an electrically propelled vehicle. (Col. 1, lines 10-12), and it is obvious for one skilled in the art to supply electric power, as described in this reference, to an electronic component of the above-mentioned vehicle.

Fujii, Yoshikawa, and Kinoshita are analogous art because they are from the same field of endeavor namely battery life determination methods.

It would have been obvious to a person of ordinary skill in the art, at the time of this invention, to add a battery used for supplying electric power to propulsion and electronic auxiliary components.

The suggestion and motivation for doing so would have been obvious in view of the teachings of Kinoshita that by adding a battery that is used in a motor vehicle for

supplying electric power to electrically propelled vehicle components and electronic components, Fujii's method of determining battery deterioration could also be used for determining battery deterioration of a motor vehicle that supplies electric power to its propulsion and electronic components as specified in the above claims.

### ***Response to Arguments***

Applicant's arguments filed on 03/12/2007 have been considered but are ineffective to overcome the Fujii and Yoshikawa references. (See the rejection above).

With respect to claim 1, applicant argues that Fujii reference does not disclose "...characteristic deterioration value for ... charge and discharge cycles at each of the plurality of depths of discharge... and summing of the determined characteristic... to obtain deterioration of a battery". Fujii, however, discloses determining characteristic deterioration value of the charge and discharge cycle in fig. 6) plurality of depths of discharge (col. 11, lines 54-59, it states that the depth of discharge is not only set to 10%, but compares different values, such as ... depth of discharge at 30-50%)... summing (a sum of "some" includes summing one value; broad interpretation; besides, fig. 4, depicts characteristics of discharge currents and duration of various batteries summed up in a single chart) of the characteristic deterioration values... to obtain deterioration of battery (fig. 4, which illustrate different discharge rates... help find characteristic deterioration values; see also col. 10, 1-20).

Regarding claim 3, applicant further argues that the curve in fig.6 of Fujii is not a deterioration curve... defining a dependency of each characteristic value...but cycle/depth curve" Fujii, contrary to applicant argument, discloses the fact that, as seen



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in fig. 6, a deterioration curve that shows a characteristic view of the depth of discharge at each level... and different level of discharge corresponds to a different levels influences the life of the secondary battery (col.11, lines 55-65). Besides, applicant's spec page 1 described that "... the deterioration of battery life corresponds to the so-called "cycle life", which indicates the possible number of charge /discharge cycles of a battery before it stops functioning". This indicates that deterioration is expressed in terms of charge/discharge cycles as illustrated in fig. 6. In addition, the limitation of claim 9 is also described in figs. 4 and 6 regarding the characteristic deterioration value on the depth of charge or discharge for the battery type.

With respect of claims 1, 2, 5, 6, 11 and 12 applicant argues that Yoshikawa reference does not teach, "... respective number of charge and discharge cycles at a plurality of depth of discharge of the battery". Yoshikawa, on the other hand, discloses determination is carried out through the steps of determining the discharge voltage characteristics the battery by discharging the electricity charged in the battery three times, and comparing that with standard discharge voltage (col. 8 and 9)... indicate the plurality of charge and discharge cycles at a plurality of depths of discharge of the battery (col. 15, 35-39) and as for measuring the cycles, the microcomputer (fig. 1, 26; see also col. 8, lines 18-25) is capable of measuring the number of charge and discharge cycles of a battery. Besides, the discharge amount is measured by the measuring part of 561, fig. 5 regarding applicant's argument of " summing the determined characteristic..." Yoshikawa discloses in fig. 2, 56 "totalizer section" sums

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up determining characteristics, such as, capacity discharges, and etc. see also par. 9, lines 29-34 ... all total values standard total value table...)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yalkew Fantu whose telephone number is 571-272-8928. The examiner can normally be reached on (M-F);(8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KARL EASTHOM  
SUPERVISORY PATENT EXAMINER